

**Amendments to the Claims**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently amended) An assembly comprising:  
an x-ray tube ~~(1)~~ including:  
an envelope ~~(14)~~ which defines an evacuated chamber in which x-rays are generated ~~(12)~~;  
a housing ~~(30)~~ which surrounds at least a portion of the envelope;  
a cooling system ~~(32, 32')~~ which circulates a coolant through the housing to remove heat from the x-ray tube, the cooling system including:  
a pump~~(40, 40')~~; and  
a flow sensor system ~~(60, 60')~~ which is responsive to a pressure difference across the pump
2. (Currently amended) The assembly of claim 1, wherein the flow sensor system includes a differential pressure transducer ~~(60, 60')~~.
3. (Currently amended) The assembly of claim 1, wherein the cooling system ~~(32, 32')~~ further includes:  
a recirculating fluid flow path ~~(33, 33')~~ including a first fluid line ~~(34, 34')~~ which connects the housing ~~(30)~~ with an upstream end of the pump ~~(40, 40')~~ and a second fluid line ~~(50, 50', 36, 36')~~ which connects a downstream end of the pump with the housing, the flow sensor system being responsive to a pressure difference between the first fluid line and the second fluid line.
4. (Original) The assembly of claim 1, wherein the flow sensor system detects a first pressure upstream of the pump and a second pressure downstream of the pump.

5. (Currently amended) The assembly of claim 1, further including a processor ~~(80, 80')~~ which receives a signal from the flow sensor system correlated with the pressure difference, the processor determining a flow rate of cooling fluid therefrom.

6. (Currently amended) The assembly of claim 5, further including:  
a control means ~~(81, 81', 82, 82', 107)~~, the control means controlling operation of the x-ray tube in the event that the determined flow rate is below a preselected minimum level.

7. (Currently amended) The assembly of claim 5, further including:  
a control means ~~(81, 81', 82, 82', 107)~~ responsive to the pressure difference controlling at least one of:  
operating power of the x-ray tube;  
operating time of the x-ray tube;  
selectable scan protocols; and  
a cooling period prior to subsequent operating of the x-ray tube

8. (Currently amended) The assembly of claim 1, further including:  
a temperature sensor ~~(90, 92)~~ which senses a temperature of circulating coolant in at least one of the housing and the cooling system.

9. (Currently amended) The assembly of claim 8, further including:  
a processor ~~(80')~~ which receives signals from the temperature sensor ~~(90, 92)~~ and flow sensor system ~~(60')~~ and determines an indication of thermal loading or remaining thermal capacity of the cooling system.

10. (Currently amended) The assembly of claim 9, wherein the processor ~~(80')~~ determines a cooling period, based on the determined indication, x-ray tube power, operating time, and duty cycle of a planned scan protocol to ensure that the x-ray tube is capable of performing the planned protocol without overheating.

11. (Currently amended) A CT-scanner ~~(100)~~ including the assembly of claim 1.

12. (Currently amended) A CT-scanner ~~(100)~~ comprising:

the assembly of claim 1;

an x-ray detector;

a scan processor; and

a display.

13. (Currently amended) A method for controlling operation of an x-ray tube ~~(1)~~, the method comprising:

circulating a cooling fluid through a housing ~~(30)~~ and over the x-ray tube with a pump ~~(40)~~;

removing heat from the cooling fluid which has circulated through the housing; and

determining a flow rate of the cooling fluid, including:

determining a pressure difference across the pump or a function which correlates with the pressure difference, and

determining the flow rate from the pressure difference or function.

14. (Original) The method of claim 13, further including:

in the event that the flow rate drops below a predetermined minimum value, reducing power to the x-ray tube

15. (Original) The method of claim 13, further including:

determining a temperature of the cooling fluid.

16. (Original) The method of claim 15, further including:

determining a temperature difference.

17. (Original) The method of claim 15, further including:

determining a thermal loading condition of the x-ray tube from the determined temperature and flow rate.

18. (Original) The method of claim 17, further including:  
in response to the determined thermal loading condition, controlling at least one of:  
operating power of the x-ray tube;  
operating time of the x-ray tube;  
selectable scan protocols; and,  
a cooling time prior to subsequent operating of the x-ray tube.
19. (Currently amended) A system for removing heat from an associated x-ray tube ~~(4)~~  
comprising:  
a fluid flow path ~~(33, 33')~~ which carries a cooling fluid to at least a portion of the associated x-ray tube, and removes heat therefrom;  
a pump ~~(40, 40')~~ which circulates the cooling fluid through the fluid flow path;  
means ~~(52, 52')~~ for determining a pressure difference across the pump; and  
means ~~(81, 81', 82, 82', 107)~~ responsive to the determined pressure difference for controlling operation of the x-ray tube.
20. (Currently amended) The system of claim 19, wherein the determining means ~~(52, 52')~~  
includes:  
a means ~~(60, 60')~~ for measuring a pressure difference across the pump ~~(40, 40')~~; and  
a means ~~(80, 80')~~ for determining cooling fluid flow rate from the determined pressure difference.
21. (Currently amended) The system of claim 20, further including:  
means ~~(90, 92)~~ for determining a temperature of the cooling fluid; and  
the means ~~(81', 82)~~ for controlling also being responsive to the determined temperature.
22. (Currently amended) The system of claim 21, further including:  
a means ~~(120)~~ for selecting a scan protocol;  
a means ~~(107)~~ for implementing a scan with the selected scan protocol;

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the controlling means ~~(81, 81', 82, 82')~~ in accordance with the determining flow rate and temperature controls at least one of:

- operating power of the x-ray tube;
- operating time of the x-ray tube; and
- selectable scan protocols